

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An image reading device comprising:
 - an infrared component separator that separates color components of an image light flux passing through a transmissive original into an infrared component;
 - an infrared image-capturing device that outputs an infrared image signal by capturing the infrared component of the image light flux that has been separated by said infrared component separator;
 - a visible component separator that separates the color components of the image light flux passing through the transmissive original into a visible component;
 - a visible image-capturing device that outputs a visible image signal by capturing the visible component of the image light flux that has been separated by said visible component separator;
 - an image forming optical system that forms the image of the light flux passing through the transmissive original at said infrared image-capturing device or at said visible image-capturing device;
 - a focal adjustment device that adjusts a position of said image forming optical system relative to the transmissive original;
 - means for image forming position decision-making that determines the position of said image forming optical system relative to the transmissive original as a visible image forming position at which the visible light component of the image light flux is formed at said visible image-capturing device, based upon said infrared image signal; and
 - a control device that implements control on said focal adjustment device based upon a decision made by said means for image forming position decision-making.

2. (Previously Presented) An image reading device according to claim 1, further comprising:

an infrared component detector that detects a level of the infrared component obtained through separation by said infrared component separator; and

a correction device that detects a defect signal attributable to dirt, dust, a scratch or the like on the transmissive original based upon the infrared component level detected by said infrared component detector and corrects the visible image signal by using said defect signal thus detected.

3. (Previously Presented) An image reading device according to claim 2, wherein:

said correction device comprises:

a defective infrared component detector that detects a defective infrared component level at a defective position in the transmissive original manifesting an infrared component level lower than a first infrared component level;

a correction coefficient calculator that obtains a correction coefficient by calculating $(\text{first infrared component level})/(\text{defective infrared component level})$ based upon said first infrared component level and said defective infrared component level;

a visible component detector that detects a visible component level of said visible component obtained through separation by said visible component separator; and

a multiplier that calculates a corrected visible component level by multiplying the visible component level at the defective position in the transmissive original by said correction coefficient.

4. (Original) An image reading device according to claim 1, wherein:

said infrared image-capturing device receives the infrared component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of

image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives a plurality of infrared image signals output by said infrared image-capturing device at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system to determine said visible image forming position in correspondence to the position of said image forming optical system relative to the transmissive original with the highest contrast value among contrast values of said plurality of infrared image signals.

5. (Original) An image reading device according to claim 1, wherein:

said means for image forming position decision-making selects either the visible image signal or said infrared image signal and determines said visible image forming position based upon the selected image signal.

6. (Original) An image reading device according to claim 5, wherein:

said means for image forming position decision-making determines said visible image forming position based upon said infrared image signal after a failure to determine said visible image forming position based upon the visible image signal occurs.

7. (Original) An image reading device according to claim 6, wherein:

said means for image forming position decision-making receives both the visible image signal and said infrared image signal in advance to determine said visible image forming position based upon said infrared image signal after a failure to determine said visible image forming position based upon the visible image signal.

8. (Previously Presented) An image reading device according to claim 6, wherein:

said means for image forming position decision-making receives the infrared image signal output by said infrared image-capturing device after occurrence of a failure to determine said visible image forming position based upon the visible image signal, to determine said visible image forming position based upon said infrared image signal.

9. (Original) An image reading device according to claim 6, wherein:

said visible image-capturing device receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives said plurality of visible image signals output by said visible image-capturing device at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system, detects the largest contrast value representing a maximum value among contrast values of said plurality of visible image signals and determines that a failure to determine said visible image forming position has occurred if the largest contrast value is smaller than a threshold value.

10. (Original) An image reading device according to claim 6, wherein:

said visible image-capturing device receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives said plurality of visible image signals output by said visible image-capturing device at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system, detects the largest contrast value representing a

maximum value among contrast values of said plurality of visible image signals, calculates a corrected largest contrast value by correcting the largest contrast value and decides that a failure to determine said visible image forming position has occurred if at least one of the contrast values obtained at measuring positions outside a specific range which includes the measuring position corresponding to the largest contrast value exceeds the corrected contrast value.

11. (Previously Presented) An image reading device according to claim 1, wherein:

said means for image forming position decision-making includes a storage device that stores a quantity of displacement manifesting between a position at which the infrared image is formed by said image forming optical system and a position at which the visible image is formed by said image forming optical system along the direction of an optical axis of said image forming optical system, to enable said means for image forming position decision-making to determine an infrared image forming position at which an image of the infrared component is formed at said infrared image-capturing device based upon said infrared image signal and to determine said visible image forming position based upon the quantity of displacement and the infrared image forming position.

12. (Currently Amended) A storage medium storing a control procedure to be implemented in an image reading device that comprises:

an infrared component separator that separates color components of an image light flux passing through a transmissive original into an infrared component;

an infrared image-capturing device that outputs an infrared image signal by capturing the infrared component of the image light flux that has been separated by said infrared component separator;

a visible component separator that separates the color components of the image light flux passing through the transmissive original into a visible component;

a visible image-capturing device that outputs a visible image signal by capturing the visible component of the image light flux that has been separated by said visible component separator;

an image forming optical system that forms the image of the light flux passing through the transmissive original at said infrared image-capturing device or at said visible image-capturing device; and

a focal adjustment device that adjusts a position of said image forming optical system relative to the transmissive original;

said storage medium storing therein:

an image forming position decision-making procedure through which the position of said image forming optical system relative to the transmissive original is determined as a visible image forming position at which an image of the visible component of the image light flux is formed at said visible image-capturing device, based upon the infrared image signal; and

a control procedure through which said focal adjustment device is controlled in conformance to the decision made through said image forming position decision-making procedure.

13. (Previously Presented) A storage medium according to claim 12, wherein:

said image forming position decision-making procedure includes a procedure through which either the visible image signal or the infrared image signal is selected and said visible image forming position is determined in correspondence to the selected image signal.

14. (Previously Presented) A storage medium according to claim 13, wherein:

said image forming position decision-making procedure includes a procedure through which said visible image forming position is determined based upon the infrared image signal after a failure to determine the visible image forming position based upon the visible image signal occurs.

15. (Previously Presented) A storage medium according to claim 14, wherein:

said visible image-capturing device receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component received at the associated pixel; and

said image forming position decision-making procedure includes a procedure through which said plurality of visible image signals output by said visible image-capturing device at a plurality of measuring points corresponding to various distances set between the transmissive original and said image forming optical system are input, a procedure through which the largest contrast value representing a maximum value among the contrast values of said plurality of visible image signals is detected and a procedure through which a decision is made that a failure to determine a visible image forming position has occurred if the largest contrast value is smaller than a threshold value.

16. (Previously Presented) A storage medium according to claim 14, wherein:

said visible image-capturing device receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said image forming position decision-making procedure includes a procedure through which said plurality of visible image signals output by said visible image-capturing device at a plurality of measuring points corresponding to various distances set between the

transmissive original and said image forming optical system are input, a procedure through which the largest contrast value representing a maximum value among the contrast values of said plurality of visible image signals is detected, a procedure through which a corrected largest contrast value is calculated by correcting the largest contrast value and a procedure through which it is decided that a failure to determine said visible image forming position has occurred if at least one of the contrast values at measuring positions outside a specific range which includes the measuring position corresponding to the largest contrast value exceeds the corrected contrast value.

17. (Currently Amended) An image reading device comprising:

means for outputting visible light and infrared light to a transmissive original;

infrared image-capturing means for outputting an infrared image signal based upon a captured infrared component of an image light flux that has passed through the transmissive original;

visible image-capturing means for outputting a visible image signal based upon a captured visible light component of the image light flux that has passed through the transmissive original;

an image forming optical system that forms an image of the light flux passing through the transmissive original at said infrared image-capturing means or at said visible image-capturing means;

a focal adjustment device that adjusts a position of said image forming optical system relative to the transmissive original;

means for image forming position decision-making that determines the position of said image forming optical system relative to the transmissive original as a visible image forming position at which the visible light component of the image light flux is formed at said visible image-capturing means, based upon said infrared image signal; and

a control device that implements control on said focal adjustment device based upon a decision made by said means for image forming position decision-making.

18. (Previously Presented) An image reading device according to claim 17, wherein:

the means for outputting visible light and infrared light selectively outputs one of the infrared light and the visible light; and

the infrared image-capturing means and the visible image-capturing means are a single image capturing device that selectively outputs one of the infrared image signal and the visible image signal depending on the light that is selectively output by the means for outputting visible light and infrared light.

19. (Previously Presented) An image reading device according to claim 17, wherein:

said infrared image-capturing means receives the infrared component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives a plurality of infrared image signals output by said infrared image-capturing means at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system to determine said visible image forming position in correspondence to the position of said image forming optical system relative to the transmissive original with the highest contrast value among contrast values of said plurality of infrared image signals.

20. (Previously Presented) An image reading device according to claim 17, wherein:

said means for image forming position decision-making selects either the visible image signal or said infrared image signal and determines said visible image forming position based upon the selected image signal.

21. (Previously Presented) An image reading device according to claim 20, wherein:

said means for image forming position decision-making determines said visible image forming position based upon said infrared image signal after a failure to determine said visible image forming position based upon the visible image signal occurs.

22. (Previously Presented) An image reading device according to claim 21, wherein:

said means for image forming position decision-making receives both the visible image signal and said infrared image signal in advance to determine said visible image forming position based upon said infrared image signal after a failure to determine said visible image forming position based upon the visible image signal.

23. (Previously Presented) An image reading device according to claim 21, wherein:

said means for image forming position decision-making receives the infrared image signal output by said infrared image-capturing means after occurrence of a failure to determine said visible image forming position based upon the visible image signal, to determine said visible image forming position based upon said infrared image signal.

24. (Previously Presented) An image reading device according to claim 21, wherein:

said visible image-capturing means receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of

visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives said plurality of visible image signals output by said visible image-capturing means at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system, detects the largest contrast value representing a maximum value among contrast values of said plurality of visible image signals and determines that a failure to determine said visible image forming position has occurred if the largest contrast value is smaller than a threshold value.

25. (Previously Presented) An image reading device according to claim 21, wherein:

said visible image-capturing means receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said means for image forming position decision-making receives said plurality of visible image signals output by said visible image-capturing means at a plurality of measuring positions corresponding to various distances set between the transmissive original and said image forming optical system, detects the largest contrast value representing a maximum value among contrast values of said plurality of visible image signals, calculates a corrected largest contrast value by correcting the largest contrast value and decides that a failure to determine said visible image forming position has occurred if at least one of the contrast values obtained at measuring positions outside a specific range which includes the measuring position corresponding to the largest contrast value exceeds the corrected contrast value.

26. (Previously Presented) An image reading device according to claim 17, wherein:

said means for image forming position decision-making includes a storage device that stores a quantity of displacement manifesting between a position at which the infrared image is formed by said image forming optical system and a position at which the visible image is formed by said image forming optical system along the direction of an optical axis of said image forming optical system, to enable said means for image forming position decision-making to determine an infrared image forming position at which an image of the infrared component is formed at said infrared image-capturing means based upon said infrared image signal and to determine said visible image forming position based upon the quantity of displacement and the infrared image forming position.

27. (Currently Amended) A storage medium storing a control procedure to be implemented in an image reading device that comprises:

means for outputting visible light and infrared light to a transmissive original;

infrared image-capturing means for outputting an infrared image signal based upon a captured infrared component of an image light flux that has passed through the transmissive original;

visible image-capturing means for outputting a visible image signal based upon a captured visible light component of the image light flux that has passed through the transmissive original;

an image forming optical system that forms an image of the light flux passing through the transmissive original at said infrared image-capturing means or at said visible image-capturing means; and

a focal adjustment device that adjusts a position of said image forming optical system relative to the transmissive original;

said storage medium storing therein:

an image forming position decision-making procedure through which the position of said image forming optical system relative to the transmissive original is determined as a visible image forming position at which an image of the visible component of the image light flux is formed at said visible image-capturing means, based upon the infrared image signal; and

a control procedure through which said focal adjustment device is controlled in conformance to the decision made through said image forming position decision-making procedure.

28. (Previously Presented) A storage medium according to claim 27, wherein:

said image forming position decision-making procedure includes a procedure through which either the visible image signal or the infrared image signal is selected and said visible image forming position is determined in correspondence to the selected image signal.

29. (Previously Presented) A storage medium according to claim 28, wherein:

said image forming position decision-making procedure includes a procedure through which said visible image forming position is determined based upon the infrared image signal after a failure to determine the visible image forming position based upon the visible image signal occurs.

30. (Previously Presented) A storage medium according to claim 29, wherein:

said visible image-capturing means receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component received at the associated pixel; and

said image forming position decision-making procedure includes a procedure through which said plurality of visible image signals output by said visible image-capturing

means at a plurality of measuring points corresponding to various distances set between the transmissive original and said image forming optical system are input, a procedure through which the largest contrast value representing a maximum value among the contrast values of said plurality of visible image signals is detected, and a procedure through which a decision is made that a failure to determine a visible image forming position has occurred if the largest contrast value is smaller than a threshold value.

31. (Previously Presented) A storage medium according to claim 29, wherein:
said visible image-capturing means receives the visible component of light passing through the transmissive original at a plurality of pixels and outputs a plurality of visible image signals each indicating an intensity level of the component of light received at the associated pixel; and

said image forming position decision-making procedure includes a procedure through which said plurality of visible image signals output by said visible image-capturing means at a plurality of measuring points corresponding to various distances set between the transmissive original and said image forming optical system are input, a procedure through which the largest contrast value representing a maximum value among the contrast values of said plurality of visible image signals is detected, a procedure through which a corrected largest contrast value is calculated by correcting the largest contrast value, and a procedure through which it is decided that a failure to determine said visible image forming position has occurred if at least one of the contrast values at measuring positions outside a specific range which includes the measuring position corresponding to the largest contrast value exceeds the corrected contrast value.